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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/542,091 04/03/00 TORRE-BUENO PH.D. J 10225-023001

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EXAMINER

MILLER, M
ART UNIT PAPER NUMBER

2623
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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/542,091

Applicant(s)

TORRE-BUENO PH.D., JOSE
DE LA

Examiner

Martin E Miller

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) 22 is/are objected to.
- 8) ☐ Claims ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: .

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: Page 5, line 3 of the specification has a minor grammatical error, the phrase "set for to moderate" needs correction.

Appropriate correction is required.

Claim Objections

2. Claim 22 is objected to because of the following informalities: the claim has an extra "the" after the word "source". Appropriate correction is required.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 21 and 22 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The limitations of the claims are directed to non-statutory functional descriptive material because it is claiming data fields that are mere program listings (i.e. descriptions or expressions of a program) that do not define any structural or functional interrelationship.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

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The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 5, 12, and 18 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claims 5, 12, and 18 recite that the "image analysis operations includes outputting a score and communicating the score", however, the specification does not provide any description of the score or what is being scored. On page 4, line 15, the applicant states that by performing the image analysis a "more accurate score" is generated. But on page 6, the applicant states at line 5 that the score is associated with the region. The use of the word "score" in different contexts makes it difficult to discern the applicant's intended meaning of the word, therefore, it is vague and indefinite. Applicant is asked to define his meaning of "score".

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, the compressed image is not specifically decompressed at the remote view station. The Examiner is assuming that the compressed image data is

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decompressed after transmittal and when displayed. However, until clarified the claim is indefinite.

Claim 23 states that the source medical image is compressed at a compression level. What does "a compression level" mean? The Examiner is broadly interpreting this to be any desired compression level and can be equal to the second compression level. It is understood that the JPEG algorithm allows for the selection of different levels of information loss based upon the amount of compression desired by the user. The claim is unclear whether the applicant means for the quality of compression is to be indicated a second time or if merely the region of interest is compressed a second time at the same quality level. Applicant is requested to verify the Examiner's interpretation or provide an explanation.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-4, 6-11, 13-17, and 19-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wood et al. (Wood), US 5851186 and Bamberger, US 5854851.

As per claim 1, Wood teaches:

generating a compressed medical image from a source medical image (col. 5, ll. 34-35, and col. 10, ll. 8-12);

transmitting the compressed medical image to a remote view station for display (col. 3, ll. 20-32);

Wood teaches that he can select a region of interest (col. 10, ll. 35-40), it is only to be cut from the image and pasted into a report document. Wood does not teach selecting a region of interest for applying image analysis. However, Bamberger teaches:

selecting a region of the displayed medical image (col. 4, ll. 23-28); and applying image analysis operations to a region of the source medical image corresponding to the selected region of the compressed medical image (col. 4, ll. 33-36).

It would have been obvious to one of ordinary skill in the art to utilize the diagnosis image enhancement features of Bamberger in the system of Wood to better assist a physician who is viewing an image remotely to enhance the image in a way that personally allows that physician to make a more informed diagnosis. By enhancing the imagery, either through zooming or grey level enhancement, the reports produced by Wood would be more informative and more detailed than without the features of Bamberger.

As per claim 2, Wood teaches:

transmitting the compressed (col. 10, l. 10) medical image over a global packet-switched network (col. 4, l. 11).

As per claim 3, Wood teaches:

transmitting region from the remote view station to a image server, wherein the region information defines the selected regions of the displayed medical image. (col. 10, ll. 35-40).

As per claim 4, Bamberger teaches:

the region information is a series of pixels. (figs. 5D-F, col. 22, ll. 30-41)

As per claim 6, Wood teaches:

receiving a diagnosis from the remote view station and associating the diagnosis with the source medical image in a database (col. 10, ll. 15-21).

As per claim 7, both Wood and Bamberger teach:

wherein selecting the compressed medical image includes receiving input from a pointing device controlled by a user to outline the region of the compressed medical image (Wood for administrative purposes, col. 10, ll. 35-40, and Bamberger for medical analysis purposes, col. 4, ll. 24-28).

As per claim 8, Wood teaches:

generating a compressed medical image includes applying a compression algorithm that reduces data losses that are detectable with human vision. (col. 10, ll. 5-12).

As per claim 9, Wood teaches:

applying JPEG compression algorithm (col. 10, l. 10).

As per claim 10, Wood teaches:

an image server storing a source medical image (col. 3, ll. 22-32) ; Wood teaches that the compressed image is sent to the remote viewer (col. 10, ll. 5-12), but

he does not teach applying image analysis to a selected area. Wood teaches that the image can be annotated to direct a viewer to a specific portion of the image when reading an associated report (col. 10, ll. 35-38). However, Bamberger teaches:

wherein the image server applies an image analysis operation on a region of the source medical image that corresponds to the selected region of the compressed medical image. (col. 4, ll. 30-41).

Therefore, it would have been obvious to one of ordinary skill in the art to implement the image enhancement features of Bamberger into the graphics features taught by Wood to provide the user with image analysis features to improve image quality, thereby allowing for a more accurate diagnosis of the effected area.

As per claim 11 recites the same limitations as claim 4 above and analogous remarks apply.

As per claim 13, it recites the same limitations as claim 6 above and analogous remarks apply.

As per claim 14, it recites the same limitations as claim 7 above and analogous remarks apply.

As per claim 15, Wood teaches:

generate a compressed medical image from a source medical image (col. 10, ll. 8-12, JPEG);

transmit the compressed medical image to a remote view station for display (col. 10, ll. 8-12); Wood teaches that a region can be selected and annotated for quicker reference when the user is viewing an image and its associated report (col. 10, ll. 35-

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38). Wood does not teach applying image analysis operations, but Bamberger does teach:

apply image analysis operations to a region of the source medical image as a function of the region information (col. 4, ll. 33-37).

It would have been obvious to one of ordinary skill in the art to implement the image enhancement features of Bamberger into the graphics features taught by Wood to provide the user with image analysis features to improve image quality, thereby allowing for a more accurate diagnosis of the effected area.

As per claim 16, it recites the same limitations as claim 2 above and analogous remarks apply.

As per claim 17, it recites the same limitations as claim 4 above and analogous remarks apply.

As per claim 19, it recites the same limitations as claim 6 above and analogous remarks apply.

As per claim 20, it recites the same limitations as claim 8 above and analogous remarks apply.

As per claim 21, Wood teaches that the medical images are stored in directories based upon patient information (col. 9, ll. 54-66). It would have been obvious to one of ordinary skill in the art to establish certain data fields for particular information.

a data field identifying a source medical image (col. 9, ll. 60-66, and col. 10, ll. 7);

a data field identifying a compressed version of the source medical image (the JPEG would have its own file extension and file, col. 10, ll. 9-11); and

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Wood does not teach specific information from the image analysis operation.

However, Bamberger teaches:

a data field storing the output score from an image analysis operation applied to a region of the source medical image. ("quantitative measurement", col. 4, l. 43).

It would have been obvious to one of ordinary skill in the art to organize the patient data, such as name, primary doctor, medication, previous diagnosis, and images, in a series of files with pointers (hyperlinks) to each of those files based upon the teachings of Wood and Bamberger to facilitate the sharing of information between remote clinics and near real-time transmittal of ultrasound data.

As per claim 22, Wood teaches:

a data field associating a diagnosis with the source medical image. ("patdir", col. 9, l. 54); Wood teaches that part of the data available from the CGI program is a program called "prtreport", which has diagnostic reports regarding the patient and obviously any associated images.

As per claim 23, Wood teaches:

compressing a source medical image at a compression level (JPEG, col. 10, l. 10)
transmitting the compressed medical image to a remote view station for display (col. 10, ll. 2-10);

receiving region information from the remote view station, wherein the region information defines a region of the compressed medical image (col. 10, ll. 35-40); and

Wood only teaches identifying a region of interest through circling, drawing or pointing to specific features not creating a new image of only the region of interest.

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Bamberger teaches that the region of interest is enhanced separately from the rest of the image. It would have been obvious to one of ordinary skill in the art to establish a separate file for the region of interest that would reduce the amount of unneeded image data and only transmitting that data. Since applicant is broadly claiming a second compression level, this compression level can be the same JPEG level as previously selected. Bamberger teaches selecting a region of interest (col. 2, ll. 36-40) and Wood teaches compressing (col. 10, l. 10). Therefore, both Wood and Bamberger teach:

compressing a region of the source medical image at a second compression level as function of the region information.

As per claims 24, 25, and 26, the recite substantially the same limitations as claims 2, 4, and 6, respectively and analogous remarks apply.

As per claim 27, Bamberger teaches:

transmitting a medical image to a remote view station for display (col. 4, ll. 13-15);

receiving region information from the remote view station, wherein the region information defines a region of the displayed medical image (col. 4, ll. 24-27); and Bamberger does not specifically state that the image processing is performed remotely, he states that the region of interest is enhanced through interactively controlled functions by the user, who could be at a remote site (col. 4, ll. 30-41). However, Wood does teach that the remote user can perform interactive image processing:

locally applying an image processing operation at the image server to a region of the source medical image as a function of the region information (col. 10, ll. 35-40).

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Wood teaches that a remote computer system can host graphics features that can alter a viewed image and Bamberger teaches that these graphics features can be image enhancement (processing) operations.

It would have been obvious to one of ordinary skill in the art to utilize the region of interest feature image enhancement features of Bamberger in combination with the features of Wood to allow a remote user to utilize the remote computer system to perform image enhancements instead of having to rely on a remote network computer. By allowing the user to use onsite image processing the user does not have to rely upon continuously transmitting and receiving which depending upon image size, complexity, and type of computer connection can be very time consuming. Therefore, the time to utilize the image enhancement features and make a diagnosis is reduced.

As per claim 28 it recites substantially the same limitation as claim 2 above and analogous remarks apply.

As per claim 29, Bamberger teaches:

the region information is a series of pixel coordinates. Bamberger teaches a region of interest (col. 4, ll. 23-26). Bamberger teaches that the image is scanned using a scanner that digitizes the image into pixels with a 256 level grey scale (col. 4, ll. 55-64). It is obvious that pixel coordinates of a particular region would be transmitted to allow for reconstruction of the original image after an area has been enhanced and also to maintain the integrity of the overall image.

As per claim 30, Wood teaches:

transmitting includes compressing the medical image (col. 10, ll. 8-12).

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10. Claims 5, 12, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wood and Bamberger as applied to claims 1, 10, and 15 above, and further in view of Nishikawa et al., (Nishikawa), US 6058322.

As per claim 5, Wood teaches providing images, reports and information (col. 12, ll. 15-32). These reports could obviously have some type of numeric ranking. However, neither Wood nor Bamberger specifically teaches that a score is output. Nishikawa teaches:

image analysis operations includes outputting a score and communicating the score to the remote view station for display (abstract, col. 31, ll. 5-15, and col. 33, ll. 3-12).

it would have been obvious to one of ordinary skill in the art to incorporate the automatic diagnosis features of Nishikawa into the system of Wood and Bamberger in order to assist diagnosis and reduce diagnostic errors due to lack of experience, or discontinued review after a single definite finding instead of completely reviewing the image data. By providing the user with a rank of all the possible threatening features in a medical image the user can make a more informed decision.

As per claim 12, it recites the same limitations as claim 5 above and analogous remarks apply.

As per claim 18, it recites the same limitations as claim 5 above and analogous remarks apply.

Conclusion


11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following US patents refer to retrieval and storage of medical images in a database: 6226636 B1 to Abdel-Mottaleb et al., and 5966465 to Keith et al. The following US patents refer to scoring of image features: Yeh et al., 6125194, Bacus et al., 6226392 B1.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin E Miller whose telephone number is 703-306-9134. The examiner can normally be reached on Monday-Friday, 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 730-308-6604. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-9051 for regular communications and After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3800.

WAM
mem
May 30, 2001


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